

CLAIMS:

We claim:

- 5 1. A composition to render a gypsum product water resistant, the composition comprising a wax characterized by having a melting point ranging from approximately 120 degrees F to approximately 185 degrees F (Mettler Drop Point), and an iodine value between 0 and approximately 30, the wax selected from the group consisting of soybean, corn, cottonseed, rape, canola, 10 sunflower, palm, palm kernel, coconut, cranbe, linseed and peanut, the composition being added to the gypsum in a quantity sufficient to render the gypsum product water resistant.
- 15 2. The composition as described in claim 1, wherein the wax consists essentially of greater than approximately 90% triglycerides (by weight), and wherein the triglycerides comprise a fatty acid, the fatty acid having between approximately 8 to 22 carbon atoms.
- 20 3. The composition as described in claim 2, wherein the triglycerides comprise from approximately 50 % by weight to approximately 98 % by weight stearic acid.
- 25 4. The composition as described in claim 2, wherein the wax has an iodine value ranging from approximately 1 to approximately 10.
5. The composition as described in claim 4, wherein the wax has an iodine value ranging from approximately 2 to approximately 5.
- 30 6. The composition as described in claim 4, wherein the melting point ranges between approximately 145 degrees F to approximately 165 degrees F.

7. The composition as described in claim 6, wherein the wax is soy wax.

5 8. The composition as described in claim 2, wherein the wax is palm wax.

9. A method to render a gypsum product water resistant, the method comprising the steps of:

forming an admixture comprising gypsum and water;

10 adding a wax to the gypsum admixture, the wax selected from the group consisting of soybean, corn, cottonseed, rape, canola, sunflower, palm, palm kernel, coconut, cranbe, linseed and peanut; the wax characterized by having a melting point ranging from approximately 120 degrees F to approximately 185 degrees F (Mettler Drop Point), and an iodine value
15 between 0 and approximately 30,

depositing the admixture between a pair of paper liners,

forming sheets of a gypsum product;

heating to a temperature between approximately 200 degrees F to approximately 300 degrees F; and

20 allowing the deposited admixture to dry

10. The method as described in claim 9, wherein the wax is added to the gypsum admixture in the form of a wax solid.

25 11. The method as described in claim 10, wherein the gypsum product comprises from approximately 1 % wax to approximately 15 % wax.

12. The method as described in claim 11, wherein the gypsum product comprises from approximately 2 % wax to approximately 10 % wax.

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13. The method as described in claim 12, wherein the gypsum product

comprises approximately 3 % wax to approximately 6.5 % wax.

14. The method as described in claim 10, wherein the wax is chosen from the group consisting of palm wax and soy wax.

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15. The method as described in claim 14, wherein the wax is soy wax.

16. The method as described in claim 9, wherein the wax is added to the gypsum admixture in the form of an emulsion.

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17. The method as described in claim 16, wherein the gypsum product comprises from approximately 1 % wax emulsion to approximately 20 % wax emulsion.

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18. The method as described in claim 17, wherein the gypsum product comprises from approximately 2 % wax emulsion to approximately 15 % wax emulsion.

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19. The method as described in claim 18, wherein the gypsum product comprises approximately 8 % wax emulsion to approximately 13 % wax emulsion.

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20. The method as described in claim 10, wherein the gypsum admixture is formed and set into a water resistant gypsum wallboard.

21. The method as described in claim 16, wherein the gypsum admixture is formed and set into a water resistant gypsum wallboard.

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22. A water resistant gypsum wallboard having a core comprising the set composition of claim 11.

23. A water resistant gypsum wallboard having a core comprising the set composition of claim 17.

24. The method as described in claim 9, further comprising the addition of one or more materials chosen from the group consisting of petroleum-derived waxes, paraffins, Fischer-Tropsch waxes, microcrystalline waxes, mineral-derived waxes, asphalt, polyvinyl alcohol, and hydrophobic agents.

25. A method for preparing a set, water resistant gypsum product comprising the steps of:
providing an aqueous mixture of gypsum;
adding at least about 1 % by weight of a vegetable wax to the mixture;
and

forming and setting the mixture into the gypsum product, wherein the total amount of the vegetable wax present is sufficient to render the set gypsum product water resistant.

26. The method as described in claim 25, wherein the wax is selected from the group consisting of soybean, corn, cottonseed, rape, canola, sunflower, palm, palm kernel, coconut, cranbe, linseed and peanut; and the wax is characterized by having a melting point ranging from approximately 120 degrees F to approximately 185 degrees F (Mettler Drop Point), and an iodine value between 0 and approximately 30.

27. The method as described in claim 26, wherein the wax is chosen from the group consisting of palm wax and soy wax.

28. The method as described in claim 27, wherein the wax is soy wax.

29. A composition to render a gypsum product water resistant, the composition comprising a wax characterized by having a melting point ranging from approximately 145 degrees F to approximately 165 degrees F (Mettler Drop Point), and an iodine value between 0 and approximately 5, the wax
5 being a soybean wax, the composition being added to the gypsum in a quantity sufficient to render the gypsum product water resistant.

30. The composition as described in claim 29, wherein the wax consists essentially of greater than approximately 90% triglycerides (by
10 weight), and wherein the triglycerides comprise a fatty acid, the fatty acid having between approximately 8 to 22 carbon atoms.

31. The composition as described in claim 30, wherein the triglycerides comprise approximately 50 % by weight to approximately 98 % by weight
15 stearic acid.

32. The composition as described in claim 30, further comprising one or more materials chosen from the group consisting of petroleum-derived waxes, paraffins, Fischer-Tropsch waxes, microcrystalline waxes, mineral-
20 derived waxes, asphalt, polyvinyl alcohol, and hydrophobic agents.